

What is claimed is:

1 1. A liquid crystal display with an integrated
2 color filter, comprising:
3 an active matrix substrate with a plurality of
4 switching elements;
5 an insulating layer formed on the active matrix
6 substrate;
7 a double-organic layer formed on the insulating
8 layer;
9 a plurality of pixel electrodes formed on the
10 double-organic layer, and electrically
11 connected to the respective switching
12 elements via a plurality of respective
13 contact holes;
14 a substrate positioned a predetermined distance
15 above the active matrix substrate; and
16 a liquid crystal layer between the two
17 substrates.

1 2. The liquid crystal display with an integrated
2 color filter as claimed in claim 1, wherein the double-
3 organic layer comprises a plurality of color-filter units
4 and a transparent organic layer.

1 3. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the color-
3 filter units layer is formed above the transparent
4 organic layer.

1 4. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the
3 transparent organic layer is formed above the color-
4 filter units layer.

1 5. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the
3 transparent organic layer is formed of polycarbonate or
4 acrylic-resin.

1 6. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the light
3 transmission of the transparent organic layer is above
4 90%.

1 7. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the
3 dielectric constant of the transparent organic layer is
4 2.6-3.6.

1 8. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the thickness
3 of the transparent organic layer is 1.5-3.5 μm .

1 9. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the
3 dielectric constant of the color-filter units is 3.5-5.0.

1 10. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the thickness
3 of the color-filter units is 1.0-2.0 μm .

1 11. The liquid crystal display with an integrated
2 color filter as claimed in claim 2, wherein the color-
3 filter units includes red, green and blue units.

1 12. The liquid crystal display with an integrated
2 color filter as claimed in claim 1, wherein the pixel
3 electrodes are made of indium tin oxide.

1 13. The liquid crystal display with an integrated
2 color filter as claimed in claim 1, wherein the contact
3 holes pass through the insulating layer and the double-
4 organic layer.

1 14. An integrated color filter, comprising:
2 a substrate;
3 a plurality of switching elements formed on the
4 substrate in a matrix arrangement;
5 an insulating layer formed on the switching
6 elements;
7 a transparent organic layer formed above the
8 insulating layer;
9 a plurality of color-filter units formed above
10 the transparent organic layer; and
11 a plurality of pixel electrodes formed above
12 the color-filter units, and electrically
13 connected to the respective switching
14 elements via a plurality of respective
15 contact holes, wherein the contact holes
16 pass through the transparent organic
17 layer, color-filter units and the
18 insulating layer.

1 15. An integrated color filter, comprising:
2 a substrate;
3 a plurality of switching elements formed on the
4 substrate in a matrix arrangement;
5 an insulating layer formed on the switching
6 elements;
7 a plurality of color-filter units formed above
8 the insulating layer;
9 a transparent organic layer formed above the
10 color-filter units; and
11 a plurality of pixel electrodes formed above
12 the color-filter units, and electrically
13 connected to the respective switching
14 elements via a plurality of respective
15 contact holes, wherein the contact holes
16 pass through the transparent organic
17 layer, color-filter units and the
18 insulating layer.

1 16. A method of fabricating an integrated color
2 filter, comprising:
3 providing a substrate;
4 forming a plurality of switching elements on
5 the substrate in a matrix arrangement;
6 forming an insulating layer on the switching
7 elements;
8 forming a transparent organic layer on the
9 switching elements, wherein the
10 transparent organic layer has a first hole

11 exposing a part of the surface of the
12 insulating layer;
13 etching the insulating layer by using the
14 transparent organic layer as an etching
15 mask to form a second hole in the
16 insulating layer, wherein the second hole
17 joins the first hole and exposes a part of
18 the surface of the switching elements;
19 forming a plurality of color-filter units with
20 a third hole on the transparent organic
21 layer, wherein the third hole forms a
22 contact hole together with the first and
23 the second holes to expose the part of the
24 surface of the switching elements; and
25 forming a plurality of pixel electrodes on the
26 color-filter units, wherein the pixel
27 electrodes are electrically connected with
28 the switching elements via the contact
29 hole.

1 17. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the transparent
3 organic layer is made of polycarbonate or acrylic-resin.

1 18. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the light
3 transmission of the transparent organic layer is above
4 90%.

1 19. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the dielectric
3 constant of the transparent organic layer is 2.6-3.6.

1 20. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the thickness of
3 the transparent organic layer is 1.5-3.5 μ m.

1 21. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the dielectric
3 constant of the color-filter units is 3.5-5.0.

1 22. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the thickness of
3 the color-filter units is 1.0-2.0 μ m.

1 23. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the color-filter
3 units includes red, green and blue units.

1 24. The method of fabricating an integrated color
2 filter as claimed in claim 16, wherein the pixel
3 electrodes are made of indium tin oxide.

1 25. A method of fabricating an integrated color
2 filter, comprising:

3 providing a substrate;
4 forming a plurality of switching elements on
5 the substrate in a matrix arrangement;
6 forming an insulating layer on the switching
7 elements;

8 forming a plurality of color-filter units with
9 a first hole on the insulating layer;
10 forming a transparent organic layer on the
11 color-filter units, having a second hole
12 to expose the first hole;
13 etching the insulating layer by using the
14 transparent organic layer as a mask,
15 forming a third hole in the insulating
16 layer to expose a part of the surface of
17 the switching elements, wherein the third
18 hole forms a contact hole together with
19 the first and the second holes; and
20 forming a plurality of pixel electrodes on the
21 transparent organic layer, wherein the
22 pixel electrodes are electrically
23 connected with the switching elements via
24 the contact hole.

1 26. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the transparent
3 organic layer is made of polycarbonate or acrylic-resin.

1 27. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the light
3 transmission of the transparent organic layer is above
4 90%.

1 28. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the dielectric
3 constant of the transparent organic layer is 2.6-3.6.

1 29. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the thickness of
3 the transparent organic layer is 1.5-3.5 μ m.

1 30. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the dielectric
3 constant of the color-filter units is 3.5-5.0.

1 31. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the thickness of
3 the color-filter units is 1.0-2.0 μ m.

1 32. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the color-filter
3 units includes red, green and blue units.

1 33. The method of fabricating an integrated color
2 filter as claimed in claim 25, wherein the pixel
3 electrodes are made of indium tin oxide.